

1965

Final project summary

Fritz Lab

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L A R G E B O L T E D J O I N T S

Project 288

Final Project Summary

RECORDS

1.1 Data Books

All the information relating to the tests conducted in Project 288 is filed in Accopress Binders in room 602. Included in these books is the new data taken from all the tests as well as any design computations, proposals, discussions, and so on. These binders are numbered consecutively from X288.4 to X288.12. Each book has a table of contents on its first page. A complete index of the material in each book is also listed in Appendix #1 to this report.

1.2 Photography

Photo Books - Prints of all photographs for 288 are mounted in one Accopress Binder located in the library. An index to the photos is on page 1.

Slides - All slides are filed and indexed in notebook 317.5, kept by Dr. J. W. Fisher, Room 403.

Negatives - Negatives are filed in the current file of Room 102, or the dead file in Room 701.

1.3 Plans and Drawings

Plans and drawings are filed in file folders numbered X288.1 for mill reports and sketches, X288.2 for K series joints, and X288.3 for E series joints.

1.4 Published Reports

A list of reports published under Project 288 is listed in Appendix 2.

A P P E N D I X #1

Index to Data Files

X288.4 through X288.12

X288.4

A. E Series Joints

1. Coupon tests on A440 plate.
2. Plate calibration tests for E419, E416, E71, E101, E131
3. Shear calibration tests - Lots 8A, 8B, H, D.
4. Direct tension tests - Lots 8A, 8B, H, E.
5. Torque tension tests - Lots 8A, 8B, H, E.
6. Combination direct tension and torque tension - Lots 8A, 8B,
H, E.

X288.5

1. Theoretical analysis of E series joints, torque study.
Determination of breakaway torque
2. E series bolting up data, all joints including pilot studies
3. E series pilot test data, joint E41a
E41b
E41c
E41e

X288.6

1. E series test data, Joint E4lf

"	"	"	E4lg
"	"	"	E4l
"	"	"	E71
"	"	"	E101
"	"	"	E46
"	"	"	E74
"	"	"	E741
"	"	"	E131
"	"	"	E161

X288.7

1. E series joints test data, Joint E163

"	"	E164
"	"	E721
"	"	E722

2. E series joint tests, strain gage data, Joint E4lf

"	"	"	E4lg
"	"	"	E4l
"	"	"	E71
"	"	"	E101
"	"	"	E46
"	"	"	E74
"	"	"	E131

2. (continued) E series joint tests, strain gage data, Joint E161

"	"	"	E741
"	"	"	E163
"	"	"	E164
"	"	"	E721
"	"	"	E722

X288.8

1. Calibration of A354 Bolts, Torqued tension
2. " " " " , Torqued to failure
3. " " " " , Repeated torqued
4. " " " " , Torqued tension and direct tension
5. " " " " , Continuous torque tension
6. " " " " , Direct tension

X288.9

1. Calibration of A354 and A490 bolts, waxed elements
 - a. Torqued tension, Lots AB, LI, GD, ED, AC, AD, CC, DD
 - b. Repeated torque, LI, AB, CC
2. Calibration of A354 and A490 bolts, lubricated elements
3. Calibration of bolts, University of Illinois, A490 Lots AA, AB, LI

X288.10

1. Calibration of Bolts, shear tests
 - a. A354 bolts, Lots AC, CC, ED, DC, FD, GD
 - b. A325 bolts, Lot 8B
 - c. A490 bolts, Lots LI, KK, AB
 - d. A502 Rivets, HR

2. 0.505 Coupon tests for bolt lots A354: AC, BC, CC, DC, AD,
BD, CD, DD, ED, FD,
GD, HD

" " A490: KK, AB, AA

" " A325: 8A, 8B, D, E, G, A,
T, U, V, W, Y, Z

" " A502 Rivets: HR

3. Calibration of Bolts, Computer Solutions

- a. A354 lots: AC, CC, ED, DC, FD, GD
- b. A325 lots: 8B
- c. A490 lots: LI, KK, AB
- d. A502 Rivets: HR

X288.11

1. K Series Joints

- a. Material Calibration
 - 1. KK lot bolts, direct, torque tension and shear tests
 - 2. plate calibration
- b. Bolting up patterns for K42a, K42b, K42c, K42d, K131, K132, K133, K191
- c. Test data for joint K42a
 - " K42b
 - " K42c
 - " K42d
 - " K131
 - " K132
 - " K133
 - " K191
- d. Strain gage data for all K series joints

X288.12

1. History of bolt tensions in joints under loads,

Strain gage data for joint K42d

" E741

1. (continued) Strain gage data for joint E721

"	E163
"	E164
"	E42d
"	E42b
"	J42b
"	J42c
"	J42d

X288.13 = Reserved for F and J series joints data

X288.14 = Currently kept in Room 421

Project 288
Final Summary of Reports

Fritz Lab
Report

- * 288.1 Project Staff
 "Summary Report to Committees 9 and 10"
 January, 1962
- + 288.2 Project Staff
 "Summary Report for RCRBSJ"
 March, 1962
- 288.3 Project Staff
 "Large Bolted Joints Project 288-Manual"
 (Contains the "File system, Summary and Phases,
 Test Preparation and Procedure, Standard Data
 Forms and Standard Project Forms" of Project 288
- # 288.4 J. W. Fisher, P. O. Ramseier, L. S. Beedle
 "Static Tension Tests of A440 Steel Joints
 Connected With A325 Bolts"
 (Reports on results of six pilot tests,
 five long joint tests and three wide joint
 tests fabricated at a tension shear ratio
 of 1/1.0. Published, Publications, IABSE,
 Vol. 23, 1963. Fritz Lab Reprint No. 245)
- # 288.5 J. L. Rumpf, J. W. Fisher
 "Calibration and Installation of A325 Bolts"
 (Revision of Report 271.11 plus additional
 studies on the heavy head A325 in conjunction
 with the tests of large joints. Published,
 Journal of the Structural Division, ASCD,
 Vol. 89, St. 6, 1963, (Fritz Lab Reprint No. 232)
- * 288.6 Project Staff
 "Summary Report to Committees 9 and 10"
 November, 1962
- * 288.7 J. W. Fisher, L. S. Beedle
 "Criteria for Designing Bolted Joints (Bearing
 Type)", February, 1963

- * 288.7A J. W. Fisher, L. S. Beedle
"Criteria for Designing Bolted Joints (Bearing Type)", July, 1964
Published, Journal of the Structural Division, ASCE, Vol. 91, St. 5, 1965

- + 288.8 Project Staff
"Summary Report for RCRBSJ"
March, 1963

- + 288.9 R. J. Christopher, J. W. Fisher
"Calibration of A354 Bolts"
March, 1963 (Preliminary Report)

- + 288.10. J. W. Fisher
"The Analysis of Bolted Place Splices"
Ph.D. Dissertation, Lehigh University, 1964

- 288.11 R. J. Christopher
"Calibration of Alloy Steel Bolts"
Master of Science Thesis, June, 1964

- 288.12 J. J. Wallaert
"The Shear Strength of A325 and Alloy Steel Structural Bolts"
Master of Science Thesis, June, 1964

- 288.13 J. J. Wallaert, G. H. Sterling, J. W. Fisher
"The History of Internal Tension in Bolts Connecting Large Joints"
December, 1964
(This report, which was distributed in February, presents the results of measurements of changes in bolt tension during tests of large joints.)

- 288.13A J. J. Wallaert, G. H. Sterling, J. W. Fisher
"What Happens to Bolt Tension in Large Joints?"
May, 1965
Published in Fasteners, Vol. 20, No. 3, 1965, pp. 8-12

- * 288.14 Project Staff
"Summary Report to Committee 10 of RCRBSJ"
December, 1963

- * 288.15 Project Staff
"Test of A490 Bolts"
February, 1964 (Preliminary Report)

- * 288.16 Project Staff
 "Summary Report to RCRBSJ"
 March, 1964
- + 288.17 J. W. Fisher, J. L. Rumpf
 "The Analysis of Bolted Butt Joints"
 September, 1964
 (Published, Journal of the Structural
 Division, ASCE, Vol. 91, No. St. 5, 1965)
- 288.18 J. W. Fisher
 "On the Behavior of Fasteners and Plates With
 Holes"
 December, 1964
 Published, Journal of the Structural Division,
 ASCE, Vol. 91, No. St. 6, December, 1965
- + 288.19 R. J. Christopher, J. W. Fisher
 "Calibration of Alloy Steel Bolts"
 September, 1964
- 288.19A R.. J. Christopher, G. L. Kulak, J. W. Fisher
 "Calibration of Alloy Steel Bolts"
 July, 1965
 (This report is a revision of 288.19. For
 publication by the ASCE in the Journal of
 the Structural Division, Vol. 92, No. St. 2,
 April, 1966.)
- + 288.20 J. J. Wallaert, J. W. Fisher
 "The Shear Strength of High-Strength Bolts"
 July, 1964
 (This report was published by the ASCE in
 the Journal of the Structural Division,
 Vol. 91, No. St. 3, June, 1965.)
- 288.21 R. J. Christopher, J. J. Wallaert
 "Project Summary Report"
 June, 1964
 (This report gives the location of various
 material, status of various phases, etc. It
 is intended only for internal use.)
- 288.22 J. W. Fisher, L. S. Beedle
 "High Strength Bolting in the U. S. A."
 August, 1964
 (A talk given at the 7th Congress of IABSE
 in Rio de Janiero. Presents a summary of
 American design concepts and summarizes tests
 of bolted connections and the development of
 installation procedures.)

- + 288.23 G. H. Sterling, E. W. J. Troup, E. Chesson, Jr.
J. W. Fisher
"Calibration Tests of A490 High-Strength Bolts"
August, 1964
(This report, written in cooperation with the University of Illinois, includes all the data contained in Fritz Laboratory Report 288.15 and the University of Illinois SRS No. 280. It was published in the Journal of the Structural Division, ASCE, Vol. 91, No. St. 5, 1965.)
- 288.24 J. W. Fisher
"Bolted Joints of High Strength Steel"
October, 1964
(A talk given at the Structural Connection Session at the Annual Meeting of ASCE in New York, October 22, 1964)
- 288.25 Project Staff
"Summary Report to Committee 10 of 'RCRBSJ'
November, 1964
- 288.26 G. H. Sterling, J. W. Fisher
"Tests of Long A440 Steel Bolted Butt Joints"
February, 1965
- 288.27 G. H. Sterling
"A440 Steel Butt Joints Connected With High Strength Bolts or Rivets"
- 288.28 Project Staff
"Summary Report to the RCRBSJ"
March, 1965
- 288.30 G. H. Sterling, J. W. Fisher
"A440 Steel Joints Connected by A490 Bolts"
August, 1965
(The report has been accepted for publication by ASCE.)
- 288.31 J. W. Fisher, G. L. Kulak, L. S. Beedle
"Behavior of Large Bolted Joints"
August, 1965
(This report summarizes the work on large bolted connections conducted at Lehigh University. It was submitted to Committee 10 and received approval for publication. This report was presented at the 45th Annual Meeting of the Highway Research Board in January, 1966.)

* Indicates distribution to sub group, Pennsylvania Department of Highways, Bureau of Public Roads and certain interested parties.

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